

PATENT ABSTRACTS OF JAPAN

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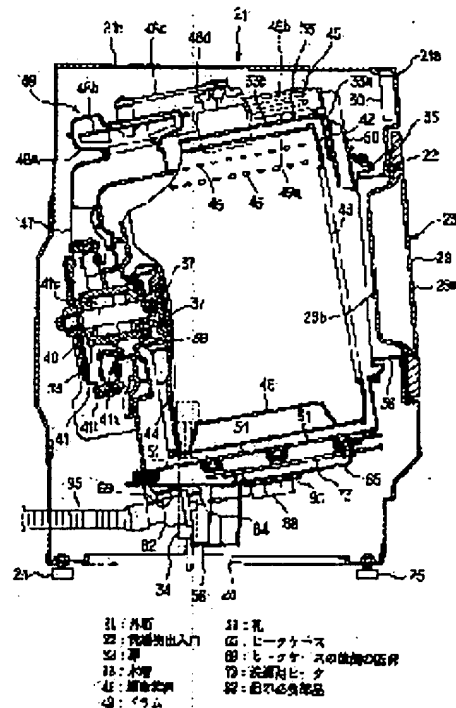
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(54) DRUM TYPE WASHING MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To facilitate removal of a washing heater and cleaning of a portion containing it.
SOLUTION: A heater case 65 is detachably mounted in the bottom of a water tank 33 and the washing heater 73 is contained within the heater case 65, so that removal of the washing heater 73 for inspection, replacement and the like of the washing heater 73 and a cleaning operation for removing dust such as waste thread collecting in the portion containing it can be carried out by tilting an outer casing 21 and removing the washing heater 73 along with the heater case 65 from an opening 24 in the bottom.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the drum type washing machine which improved the arrangement structure of the heater for wash.

[0002]

[Description of the Prior Art] It seems that the configuration of the conventional drum type washing machine is shown in drawing 8 . That is, while a tank 1 is assembled by front plate 1a by the side of drawing Nakamigi, and box subject 1b which has the other remaining subject part and the washing entrance 2 is formed in front plate 1a which is the front section, the door 3 which opens and closes this is formed. Moreover, the comparatively big opening 4 is formed in the pars basilaris ossis occipitalis of box subject 1b.

[0003] A tank 5 carries out elastic support to the interior of a tank 1 by the suspension 6 (one of the sets which has two or more sets is illustrated), and is arranged in it, and the drum 7 is arranged in the interior of this tank 5 pivotable. These tanks 5 and a drum 7 all have openings 8 and 9 in the front section, and the opening 8 of the tank 5 of them is put in a row by said washing entrance 2 watertight with the bellows 10. Moreover, the tank 5 is assembled by front plate 5a which has opening 8, and tub subject 5b which has the other remaining subject part.

[0004] The drum 7 has many water flow holes 11 in the drum section (only a part is illustrated), and the driving gear 12 which carries out the rotation drive of the drum 7 is attached behind the tank 5. And the bulge section 13 which bulges below is formed in the pars basilaris ossis occipitalis of tub subject 5b of a tank 5, and the heater 14 for wash is contained inside this bulge section 13. Furthermore, under the posterior part of this bulge section 13, the GIYADO motor 15 and the drain valve 16 which are opened and closed by this are attached.

[0005] A door 3 is opened at the time of wash, and the washing is put in with a required detergent in a drum 7 through the opening 8 of a tank 5, and the opening 9 of a drum 7 in bellows 10 with this configuration from the washing entrance 2. And a door 3 is closed, the actuation switch which does not illustrate is operated and operation is made to start. Then, when the water of the specified quantity is supplied as wash water and low-speed rotation of the drum 7 is continuously carried out with a driving gear 12 by the water service installation which is not illustrated into a tank 5, wash (it is washing at first) of the washing is performed. Moreover, when the heater 14 for wash generates heat, wash water is heated and wash is made to be performed at the time of this washing effectively.

[0006] Then, by opening a drain valve 16 wide, wastewater with which the wash water which turned into the sanitary sewage is discharged out of a tank 5 is performed, and specified quantity supply of the new water is carried out into a tank 5 instead of it. And wash (rinse in this case) of the washing is performed in that condition by carrying out low-speed rotation of the drum 7 by the driving gear 12 again. The heater 14 for wash does not generate heat at the time of this rinse. And while carrying out wastewater out of a tank 5 after that further, dehydration of the washing is performed by carrying out high-speed rotation of the drum 7 by the driving gear 12.

[0007]

[Problem(s) to be Solved by the Invention] In the case of the above-mentioned conventional thing, the heater 14 for wash is contained by the bulge section 13 formed in the pars basilaris ossis occipitalis of tub subject 5b of a tank 5. For this reason, in case this heater 14 for wash was demounted in order to perform check of the heater 14 for wash, exchange, etc., front plate 1a of a tank 1 needed to be demounted, it needed to be performed, and the activity was large-scale.

[0008] Moreover, it will be possible that contaminants, such as waste thread, collect on the bulge section 13 of a tank 5, and it will be necessary to remove it. Front plate 1a of a tank 1 was demounted upwards, and front plate 5a of a tank 5 was demounted, the drum 7 was taken out further, it edited in the tank 5, and the activity also with this large-scale of cleaning the bulge section 13 was needed for this chip box.

[0009] This invention is made in view of an above-mentioned situation, therefore the purpose is mainly in offering removal of the heater for wash, and the drum type washing machine which can perform easily cleaning of the part which contained it.

[0010]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the drum type washing machine of this invention The tank which has the door which opens and closes a washing entrance and this in the front section, and the tank arranged in the interior of this tank, The drum which holds the washing which is arranged in the interior of this tank pivotable, and is thrown in from said washing entrance, The driving gear which carries out the rotation drive of this drum, and the heater case attached in the pars basilaris ossis occipitalis of said tank removable, It is contained inside this heater case and characterized by providing the heater for wash which heats the wash water supplied to the interior of said tank inside this heater case, and changing (invention of claim 1).

[0011] What is necessary is just to demount the heater for wash from the pars basilaris ossis occipitalis of a tank the whole heater case, in case removal of the heater for wash and the part which contained it are cleaned according to this thing. In this case, in that by which the drum and the tank were prepared in the inclination condition of a front riser, it is good to be formed so that the pars basilaris ossis occipitalis on the backside [a heater case] may constitute the shape of a horizontal (invention of claim 2).

[0012] In the case of that by which the drum and the tank were prepared in the inclination condition of a front riser, it has the advantage that the interior of a drum is legible and tends to carry out the activity of receipts and payments of the washing itself. However, since a heater case will also incline in a front riser (falling the back) while a drum and a tank incline in a front riser, the whole vertical dimension increases. On the other hand, in what was formed so that the pars basilaris ossis occipitalis on the backside [a heater case] might constitute the shape of a horizontal as mentioned above, the part and the whole vertical dimension are stopped small.

[0013] Moreover, after accomplishing the shape of a horizontal of an above-mentioned heater case, under the near pars basilaris ossis occipitalis, it is good to arrange other need components (invention of claim 3). In this thing, in the place whose whole vertical dimension increases further by arrangement of other need components, when the pars basilaris ossis occipitalis on the backside [a heater case] constitutes the shape of a horizontal, much more increment in the whole vertical dimension is controlled.

[0014] Furthermore, it is good for a heater case to form the heater for wash removable (invention of claim 4). In this thing, the heater for wash is further demounted from the heater case removed from a tank, and check of this heater for wash, exchange, etc. can be performed in the heater independent for wash. Moreover, cleaning of a heater case can also be performed in a heater case independent.

[0015] It is good to, form in a part for the joint of a tank and a heater case two or more holes which make the interior of a tank and a heater case open for free passage on the other hand (invention of claim 5). In this thing, the wash water in a tank comes to circulate through the heater part for wash with two or more holes, and the heating effectiveness of wash water becomes good. Moreover, also in packing stopped watertight, while being able to stop that magnitude small, more positive seal can make it what is necessary be just to prepare a part for the joint of a tank and a heater case to each of two or more holes in this case.

[0016] Moreover, it replaces with two or more above-mentioned holes, and one opening of the magnitude for plurality of a **** this hole may be formed in a part for the joint of a tank and a heater case (invention of claim 6). In this thing, the wash water in a tank comes to circulate through the heater part for wash from one big opening, and the heating effectiveness of wash water becomes much more good.

[0017] And the heater for wash is good to be located in the bottom of the space formed inside a tank and a heater case (invention of claim 7). In this thing, it will be located in the underwater deepest part of the wash water with which the heater for wash is missing from the interior of a heater case withwater, and is stored from the interior of a tank, and heating effectiveness becomes good.

[0018]

[Embodiment of the Invention] Hereafter, it explains with reference to drawing 1 per 1st example of this invention thru/or drawing 5. First, the tank 21 shown in drawing 1 is assembled by front plate 21a by the side of drawing Nakamigi, and box subject 21b which has the other remaining subject part. While forming the washing entrance 22 in the center of **** of the inclined plane section which constitutes the letter of an inclination of **** facing up, the door 23 which opens and closes this is formed in front plate 21a which is the front section of this tank 21. Moreover, the comparatively big opening 24 which occupies the **** whole region is formed in the pars basilaris ossis occipitalis of box subject 21b, and two or more feet 25 are formed in it under the perimeter section.

[0019] A door 23 is doubled with the configuration (it is circular although not illustrated) of the washing entrance 22, as shown in drawing 2, it is circular, it has the hinge 26 for closing motion at the left-hand side edge, and has Toride 27 and the hook 28 for closing condition maintenance at the right-hand side edge. Moreover, this door 23 has the fluoroscopy section 29 in the center section, and this fluoroscopy section 29 consists of the clear glass 29a and 29b of a duplex, as shown in drawing 1.

[0020] Furthermore, the control unit 30 which controls operation of the drum type washing machine of this example at large is arranged in the tooth back of the upper part of front plate 21a of a tank 21 located more nearly up than this door 23, and as shown in drawing 2, the control panel 31 and the detergent injection case 32 for carrying out actuation concerning operation are prepared in the front face of the upper part of front-face plate of tank 21a.

[0021] On the other hand, the tank 33 is arranged in the interior of a tank 21. As the shape of a drum of a cylindrical shape is accomplished and it is shown in drawing 1, this tank 33 is assembled by front plate 33a and tub subject 33b which has the other remaining subject part, and is carrying out elastic support of it through the suspension 34 of 2 sets of right and left shown in drawing 3 on the base of box subject 21b of a tank 21. As shown in drawing 1, the support gestalt of this tank 33 has the shape of an axis of abscissa which the shaft orientations of a tank 33 become order, and, moreover, is in the inclination condition of a front riser.

[0022] Opening 35 is formed in front plate 33a which is the front section of a tank 33, and this opening 35 is put in a row watertight with the bellows 36 to it at the washing entrance 22 of said tank 21. On the other hand, the bearing housing 38 is attached in the core of the rear-face section where the tank 33 was blockaded.

[0023] The bearing housing 38 is inserting bearing 39 and 40 in the inner circumference section of order, and has attached stator 41a of a motor 41 in the hind periphery. This motor 41 consists for example, of the brush loess direct-current motor of the outer rotor form where it has Rota 41b in the method of the outside of a perimeter of stator 41a, inserts in the bearing 40 and 39 of the above-mentioned bearing housing 38 shaft 41c united with that Rota 41b, and is projecting and locating that point in a tank 33.

[0024] The drum 42 is arranged in the interior of a tank 33 pivotable. This drum 42 accomplishes a cylindrical shape [small diameter / tank / 33], and forms opening 43 in that front section. the rear-face section by which this drum 42 was blockaded on the other hand -- a support plate 44 -- attaching -- **** -- the core of the rear-face section of this support plate 44 and a drum 42 -- the bolt 37 of plurality [point / of shaft 41c of the above-mentioned motor 41] -- attaching -- this anchoring -- a drum 42 -- a tank 33 -- the same -- it has the shape of an axis of abscissa which shaft orientations become order, and,

moreover, has prepared in the inclination condition of a front riser.

[0025] In addition, by the anchoring, it is also made to carry out the rotation drive of the drum 42 by the motor 41, therefore a motor 41 functions as a driving gear which carries out the rotation drive of the drum 42. In addition, many water flow holes 45 which serve as a ventilating hole are formed in the drum section of a drum 42 throughout **** (only a part is illustrated). Moreover, the baffle 46 of the washing offered for running through is attached in the inner circumference section of a drum 42 at several places (this also illustrates only a part).

[0026] It compared with the motor 41 in the rear-face section of a tank 33 again, and the dehumidifier 47 is attached. When it is hollow-like, and the lower limit section is open for free passage to the whole in a tank 33 and fills it with the upper part to water from the lower limit section for the air in that tank 33, as a result the air in a drum 42 to through and it upwards, this dehumidifier 47 makes the moisture of the air passing through that interior cool and condense, and is dehumidified.

[0027] The blower 48 and the heater 49 for desiccation are arranged in the upper part section of a tank 33. Among these, the blower 48 consists of motor 48d which carries out the rotation drive of the upper limit section of the above-mentioned dehumidifier 47, casing 48a which was open for free passage, ventilation wing 48b arranged in the interior of this, and this ventilation wing 48b through belt transmission device 48c, and lets the air in the above-mentioned tank 33, as a result the air in a drum 42 pass upwards from the lower limit section of a dehumidifier 47.

[0028] Moreover, the heater 49 consists of case 49a which was open for free passage to casing 48a of a blower 48, and heater 49 for desiccation b arranged in this case 49a, and heats the air which is dehumidified by the above-mentioned dehumidifier 47 and sent by the blower 48. A deer is carried out and the duct 50 is arranged in the front section of a tank 33, and he returns the air heated with the above-mentioned heater 49 in a tank 33, as a result a drum 42, and is trying to circulate it with this duct 50.

[0029] And as shown also in drawing 4, two or more (three pieces in this case) holes 51 for water flow are formed forward and backward at the pars basilaris ossis occipitalis of a tank 33, especially the bottom of that center. This hole 51 has constituted the circle configuration which each shows to drawing 5, and forms the attachment boss [two or more (six pieces in this case)] 52 in the inferior surface of tongue of all those perimeter sections.

[0030] The 1st heater covering 53 is located under the hole 51. On the other hand, this 1st heater covering 53 For example, while having the circular hole 54 which accomplishes **** rectangle tabular and corresponds with each of the holes 51 of the above-mentioned tank 33 by the product made of synthetic resin It has the mounting hole 55 corresponding to those perimeter sections with the attachment boss 52, and has two or more (in this case, the attachment boss 56 is three pieces and four pieces and the attachment boss 58 are [the attachment boss 57] also four pieces) attachment bosses 56, 57, and 58 in the inferior surface of tongue of that perimeter section further, respectively. Moreover, the lead-wire support 59 is formed under the front end section (the drawing 5 Nakamigi side edge section) of this 1st heater covering 53.

[0031] With this configuration, the respectively circular packing 60 was made to intervene between the periphery sections of holes 54 and 51, and by this condition, **** 61 was screwed in the attachment boss 52 of a tank 33 from the mounting hole 55, and was bolted, it had it, respectively, and the 1st heater covering 53 is attached in the tank 33 watertight.

[0032] Moreover, to it, the 2nd heater covering 62 is located under the 1st heater covering 53, and this 2nd heater covering 62 is the metal plate made from a griddle which has the fire prevention function of [in the 1st heater covering 53 and a tank 33], for example, a product, and has accomplished **** rectangle tabular, and it has each of holes 54, and the circular corresponding hole 63. Moreover, the packing 64 with a big rectangle is made to intervene between the perimeter sections of this 2nd heater covering 62 and the 1st heater covering 53.

[0033] Furthermore, the heater case 65 is located under the 2nd heater covering 62, and this heater case 65 has also constituted the shape of a comparatively shallow bottom container of a **** rectangle, it makes the attachment bosses 56, 57, and 58 of said 1st heater covering 53 correspond to flange 65a of that upper periphery, respectively, and forms mounting holes 66, 67, and 68 in it with the metal plate

made from a griddle, for example, a product.

[0034] Moreover, the slant surface part 69 is formed in the pars basilaris ossis occipitalis on the backside [this heater case 65] (inside of drawing, left-hand side), and the exhaust port 70 is formed in this slant surface part 69. In addition, the heater support 71 is attached in the pars basilaris ossis occipitalis of the **** center section of the heater case 65 by welding, it is made to correspond to this and the heater through hole 72 is formed in the side-attachment-wall center section by the side of before the heater case 65 (inside of drawing, right-hand side).

[0035] The heater 73 for wash which it lets pass to the heater through hole 72 to these It consists of the sheath heater of U typeface. In the end face section of this heater 73 for wash While inserting in the 1st maintenance plate 74 holding spacing of this heater 73 for wash, and the seal 75 made of heat-resistant rubber The 2nd maintenance plate 76 holding spacing of the heater 73 for wash is attached, and they are unified by [which protruded on the 1st maintenance plate 74 of them] ****ing, letting a rod 77 pass from a seal 75 to the 2nd maintenance plate 76, and binding tight with a nut 79 through a washer 78.

[0036] And as shown in drawing 4 , by letting a point pass to said heater support 71, letting a seal 75 pass from through and the 2nd maintenance plate 76 to the heater through hole 72, and making this seal 75 close to the periphery section of the heater through hole 72, the heater 73 for wash which it let pass to the heater through hole 72 was contained and supported inside the heater case 65, and is attached in this heater case 65 watertight.

[0037] Moreover, if the heater 73 for wash is lengthened from that attachment condition in this case, while a seal 75 will secede from the heater through hole 72, when the point of the heater 73 for wash secedes from the heater support 71, this heater 73 for wash can be demounted, and in this way, the heater 73 for wash is attached in the heater case 65 removable, and it has attached possible [extraction and insertion] especially. In addition, he lets the lead wire 80 beforehand connected to the end face section of this heater 73 for wash pass to the lead-wire support 59 of said 1st heater covering 53, and is trying to hold it in the state of attachment of the heater 73 for wash.

[0038] Carry out a deer, lay the 2nd heater covering 62 in the heater case 65, and packing 64 is further laid on this 2nd heater covering 62. By [which let it pass to the mounting hole 66, respectively] ****ing, and screwing in and binding 81 tight to the attachment boss 56 of the 1st heater covering 53, making the inferior surface of tongue of the 1st heater covering 53 carry out the pressure welding of the packing 64 The heater case 65 is attached in the 1st heater covering 53 watertight through the 2nd heater covering 62 and packing 64, as a result the heater case 65 is attached in the pars basilaris ossis occipitalis of a tank 33 removable through the 1st heater covering 53.

[0039] Drawing 1 shows the attachment condition of this heater case 65, the heater case 65 has also constituted the inclination condition of a front riser in connection with said tank 33 constituting the inclination condition of a front riser, it is in this condition and said slant surface part 69 of the heater case 65 has constituted the shape of level. Moreover, the heater 73 for wash is located in the bottom of the space formed inside a tank 33 and the heater case 65.

[0040] And down the above-mentioned slant surface part 69 of the heater case 65, the drain valve 82 is arranged, and anchoring of this drain valve 82 is performed by screwing in and binding tight the drain-valve tie-down plate 84 which this drain valve 82 was ****ed and was attached by 83 from the mounting hole 86 of the drain-valve tie-down plate 84 to said attachment boss 58 of the 1st heater covering 53 through said mounting hole 68 of the heater case 65 according to **** 85, as shown in drawing 5 . Moreover, the chip box and a drain valve 82 are making said exhaust port 70 of the heater case 65 open for free passage watertight through packing 87.

[0041] Furthermore, down the **** center section of the heater case 65, the GIYADO motor 88 is arranged, and anchoring of this GIYADO motor 88 is also performed by screwing in and binding tight the GIYADO motor tie-down plate 90 which this GIYADO motor 88 was ****ed and was attached by 89 from the mounting hole 92 of the GIYADO motor tie-down plate 90 to said attachment boss 57 of the 1st heater covering 53 through said mounting hole 67 of the heater case 65 according to **** 91, as shown in drawing 5 .

[0042] Moreover, the valve rod 94 of a drain valve 82 is connected, and the GIYADO motor 88

lengthens a valve rod 94 to the point of the wire 93 drawn from the GIYADO motor 88 with a wire 93, and he is trying to make it open a drain valve 82 wide by this. Therefore, the GIYADO motor 88 functions as drain-valve disconnection equipment, and, on the other hand, the energization force of the spring (not shown) built in the drain valve 82 is made to perform lock out of a drain valve 82. In addition, as shown in drawing 1, the point has connected to a drain valve 82 the exhaust hose 95 located outside the plane.

[0043] in addition -- the inferior-surface-of-tongue section outside a tank 33 -- a package -- public funds -- an implement 96 -- attaching -- **** -- this package -- public funds -- an implement 96 is the thing of a upward KO typeface, engages with the pars-basilaris-ossis-occipitalis buffer of the package equipment which is not illustrated at the time of a package, and prevents the shake of a tank 33.

[0044] Next, an operation of the thing of the above-mentioned configuration is described. A door 23 is opened at the time of wash, and the washing is put in in a drum 42 through the opening 43 of the inside of bellows 36, and a drum 42 from the washing entrance 22. Moreover, a detergent required in the detergent injection case 33 is put in, and this is set. And if a door 23 is closed, the required switch of a control panel 31 is operated and operation is made to start, while the water of the specified quantity will be supplied as wash water by the water service installation which is not illustrated in a tank 33, the detergent within the detergent injection case 33 is thrown in, and wash (it is washing at first) of the washing is performed by carrying out low-speed rotation of the drum 42 by the motor 41 continuously. Moreover, at the time of this washing, when the heater 73 for wash generates heat, wash water is heated and wash is performed effectively.

[0045] Then, by opening a drain valve 82 wide by the GIYADO motor 88, wastewater with which the wash water which turned into the sanitary sewage is discharged outside the plane through the exhaust port 70 of the heater case 65 and a drain valve 71, and an exhaust hose 95 from the inside of a tank 33 is performed, and specified quantity supply of the new water is carried out into a tank 33 instead of it. And wash (rinse in this case) of the washing is performed in that condition by carrying out low-speed rotation of the drum 42 by the motor 41 again. The heater 73 for wash does not generate heat at the time of this rinse. Then, while carrying out wastewater out of a tank 33, dehydration of the washing is performed by carrying out high-speed rotation of the drum 42 by the motor 41.

[0046] And while low-speed rotation of the drum 42 is further carried out by the motor 41 after that, a blower 48 operates and it combines, and while heater 49b for desiccation generates heat, water is poured out from the upper part in a dehumidifier 47. The air in a drum 42 is attracted in a dehumidifier 47 through the inside of a tank 33 by these from the water flow hole (ventilating hole) 45, it passes along the inside of this dehumidifier 47, and circulation returned in a drum 42 through a blower 48, a heater 49, and a duct 50 in order is performed. And since that recirculating air will be heated with a heater 49 by heater 49b for desiccation, it will turn into hot blast and this hot blast will be supplied in a drum 42, the washing in a drum 42 is gradually dried by that hot blast.

[0047] Furthermore, the moisture which evaporated from the washing during this desiccation is condensed and dehumidified by being cooled with the water poured out in this dehumidifier 47, when it is contained in the air which comes out out of a drum 42 and this air passes along the inside of a dehumidifier 47. In addition, the water passing through the inside of a dehumidifier 47 enters in a tank 22, and is discharged through an above-mentioned drain valve 82 and an above-mentioned exhaust hose 95 out of this tank 22.

[0048] Now, in the thing of this configuration, the heater case 65 was attached in the pars basilaris ossis occipitalis of a tank 33 removable, and the heater 73 for wash is contained inside this heater case 65. What is necessary is to lean a tank 21 and just to demount the heater 73 for wash from the opening 24 of a pars basilaris ossis occipitalis the whole heater case 65, in case this performs removal of this heater 73 for wash for performing check of the heater 73 for wash, exchange, etc., and cleaning which removes contaminants, such as waste thread which collects on the part which contained it.

[0049] In addition, in the thing of the chip box, especially the above-mentioned configuration, while removing **** 81 and demounting the heater case 65 from the 1st heater covering 53, **** 85 is removed, the drain-valve tie-down plate 84 is also demounted from the 1st heater covering 53, **** 91

is removed further, and the GIYADO motor tie-down plate 90 is also demounted from the 1st heater covering 53.

[0050] Thus, it is that as for which check of the heater 73 for wash, exchange, etc. and cleaning of the part which contained the heater 73 for wash are made to a request, respectively. Removal of front plate 1a of the tank 1 when demounting the conventional heater 14 for wash, Removal of front plate 1a of the tank 1 when cleaning the bulge section 13 which contained the heater 14 for wash, And removal of front plate 5a of a tank 5 and a large-scale activity which is said to a list as drawing of a drum 7 are not needed, but removal of the heater 73 for wash and cleaning of the part which contained it can be performed easily, respectively.

[0051] Moreover, the drum 42 and the tank 33 are formed in the inclination condition of a front riser, and the interior of the washing entrance 22 to the drum 42 is legible, and becomes easy to carry out the activity of receipts and payments of the washing itself by this. However, with the inclination of a tank 33, the heater case 65 attached in the pars basilaris ossis occipitalis of a tank 33 also inclines in a front riser (falling the back), and has a possibility that the whole vertical dimension may increase. On the other hand, the pars basilaris ossis occipitalis on the backside [the heater case 64] is formed so that the shape of level may be accomplished in the state of the attachment, and it can stop the part and the whole vertical dimension small.

[0052] Furthermore, after accomplishing the shape of level [of the above-mentioned heater case 65], the drain valve 82 is arranged under the near pars basilaris ossis occipitalis. In this case, caudad, if a drain valve 82 is arranged, when the pars basilaris ossis occipitalis on the backside [the heater case 65] constitutes the shape of level, much more increment in the whole vertical dimension can be controlled to there being a possibility of the pars basilaris ossis occipitalis on the backside [the heater case 65 which inclined in the front riser (falling the back)] that the whole vertical dimension may increase further. In addition, it is not restricted to a drain valve 82, but if it is other need components to the heater 73 for wash which are arranged under the near pars basilaris ossis occipitalis after accomplishing the shape of a horizontal of the heater case 65, it is good anything.

[0053] in addition -- from the heater case 65 which has formed the heater 73 for wash in the heater case 65 removable, and this demounted from the tank 33 -- further -- the heater 73 for wash -- demounting -- check of this heater 73 for wash, exchange, etc. -- heater 73 independent one for wash -- a request -- and it can carry out without exchanging even the heater case 65, and can carry out cheaply. Moreover, cleaning of the heater case 65 can also be performed to a request by heater case 65 independent one.

[0054] In addition, since the heater 74 for wash is formed in the heater case 64 also possible [extraction and insertion] in this case, depending on the case, the heater case 65 is kept attached in a tank 33, only the heater 73 for wash is extracted and removed, and it may be made to perform check of this heater 73 for wash, exchange, etc.

[0055] and to the pars basilaris ossis occipitalis of a tank 33 which is a part for the joint of a tank 33 and the heater case 65, the 1st heater covering 53, and the 2nd heater covering 62 Two or more holes 51, 54, and 63 which make the interior of a tank 33 and the heater case 65 open for free passage are formed, respectively. By this With two or more of the holes 51, the wash water in a tank 33 comes to circulate through heater 73 part for wash, and can improve heating effectiveness. Moreover, more positive seal can be performed, while that magnitude can be stopped small and the packing 60 stopped watertight can also make it cheaply what is necessary be just to prepare between a part for the joint of a tank 33 and the heater case 65, a tank 33, and the 1st heater covering 53 to each of two or more holes 51 and 54 in this case.

[0056] Furthermore, since he is trying to locate the heater 73 for wash in the bottom of the space formed inside a tank 22 and the heater case 65 and it will be located in the underwater deepest part of the wash water with which the heater 73 for wash is missing from the interior of the heater case 65 withwater, and is stored by this from the interior of a tank 33, it can improve heating effectiveness of wash water.

[0057] To the above, drawing 6 and drawing 7 show the 2nd example of this invention, give the same sign to the same part as the 1st example of the above, omit explanation, and describe only a different part. the pars basilaris ossis occipitalis of a tank 33 which is a part for the joint of a tank 33 and the

heater case 65 in the case of this thing, and two or more above-mentioned holes [covering / 62 / 2nd / 1st heater covering 53 and / heater] 51, 54, and 63 -- replacing with -- each of the **** this holes 51, 54, and 63 -- every one opening 101,102,103 of the rectangle of the magnitude of every plurality is formed.

[0058] Moreover, the packing 104 with the big rectangle which surrounds opening 101,102 is made to intervene in connection with it between the pars basilaris ossis occipitalis of a tank 33, and the 1st heater covering 53. Since the wash water in a tank 33 comes to circulate through heater 73 part for wash from every one big opening 101,102,103 by doing in this way, heating effectiveness of wash water can be improved further.

[0059] In addition, this invention is not limited only to the example which described above and was shown in the drawing, and you may make it the pulley connected with a drum 42 instead of the above-mentioned motor 41 in the regions of back of a tank 33 as a driving gear which carries out the rotation drive of the drum 42, the motor which will estrange from now on and gives the rotational motion force to this pulley through a belt constitute it. Moreover, the configuration for drying the washing does not need to be equipped with a dehumidifier 47, a blower 48 and a heater 49, a duct 50, etc.

[0060]

[Effect of the Invention] This invention is a thing as explained above, and does the following effectiveness so. Since what is necessary is just to demount the heater for wash from the pars basilaris ossis occipitalis of a tank the whole heater case in case removal of the heater for wash and the part which contained it are cleaned according to the drum type washing machine of claim 1, removal of the heater for wash and cleaning of the part which contained it can be performed easily.

[0061] According to the drum type washing machine of claim 2, the vertical dimension of the whole can be small stopped to there being a possibility that the whole vertical dimension may increase, with the inclination of a tank. According to the drum type washing machine of claim 3, much more increment in the vertical dimension of the whole can be controlled to there being a possibility that the whole vertical dimension may increase further. according to the drum type washing machine of claim 4 -- check of the heater for wash, exchange, etc. -- the heater independent for wash -- a request -- and while being able to carry out cheaply, cleaning of a heater case can also be performed to a request by the heater case independent.

[0062] According to the drum type washing machine of claim 5, while the heating effectiveness of wash water can improve, about the water seal for a joint of a tank and a heater case, the magnitude of packing to be used can be stopped small, it can do cheaply and more positive water seal can be carried out. According to the drum type washing machine of claim 6, heating effectiveness of wash water can be improved further. Heating effectiveness of wash water can be improved also with the drum type washing machine of claim 7.

[Translation done.]

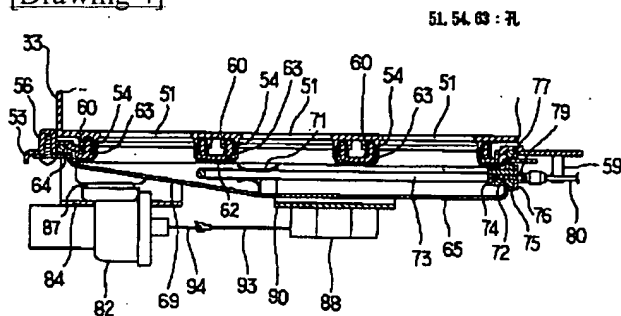
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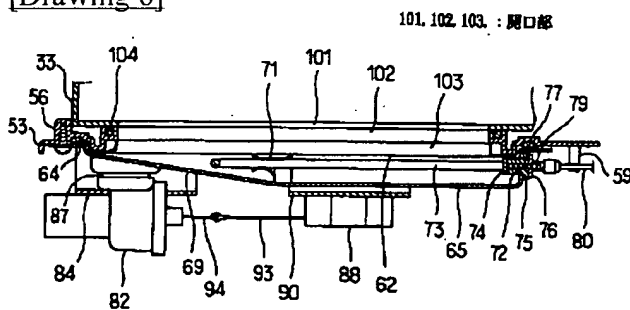
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

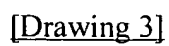
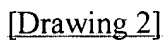
[Drawing 4]

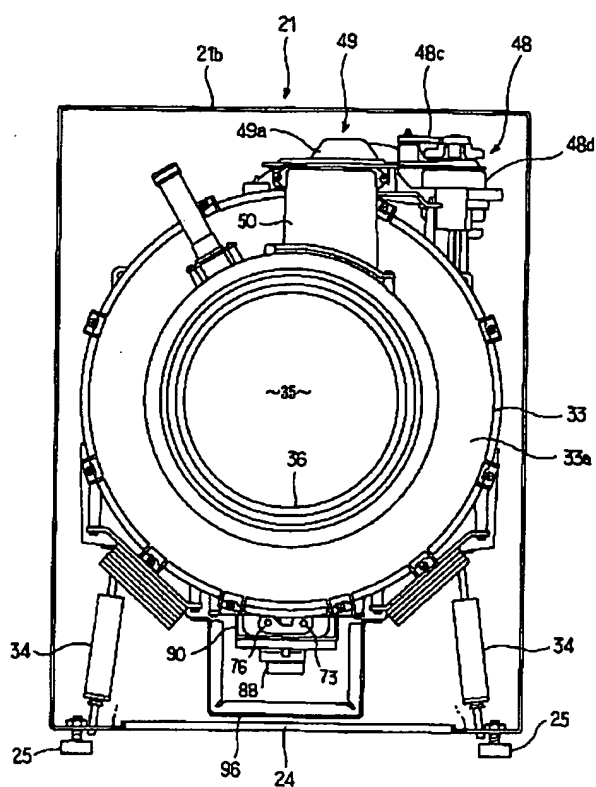


[Drawing 6]

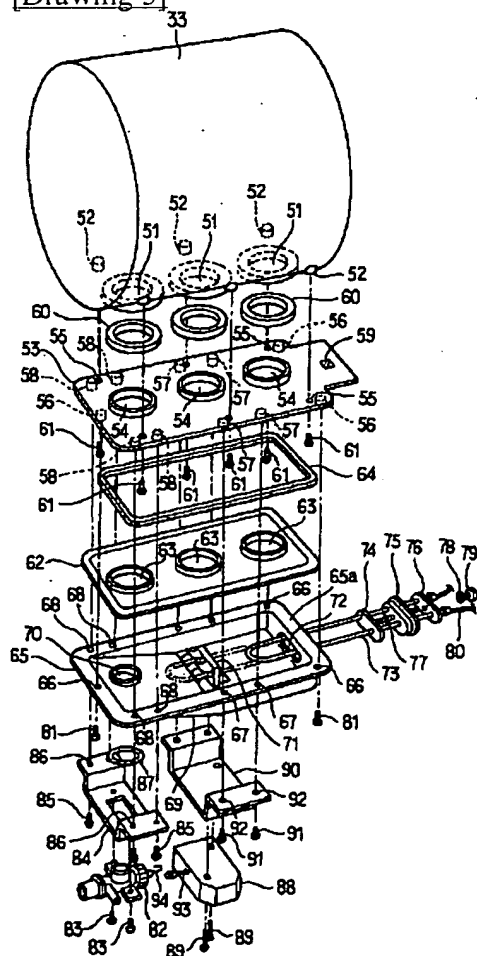


[Drawing 1]

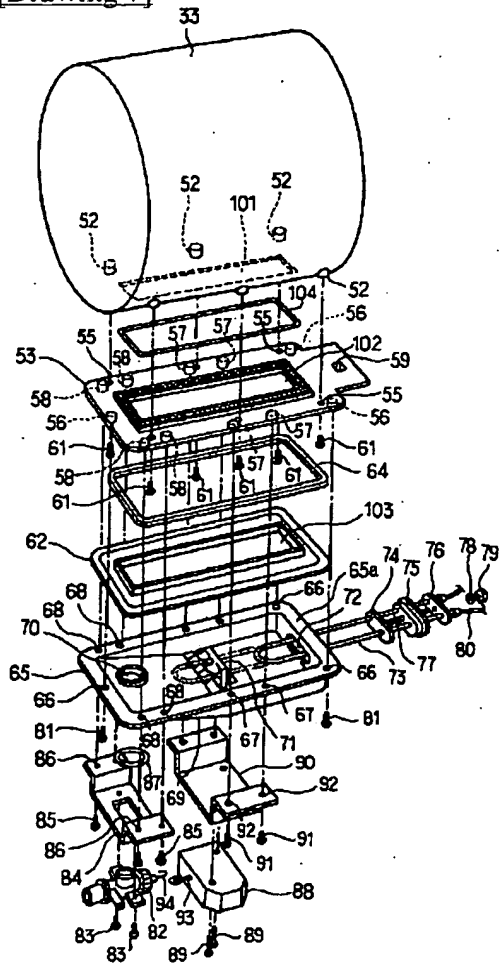




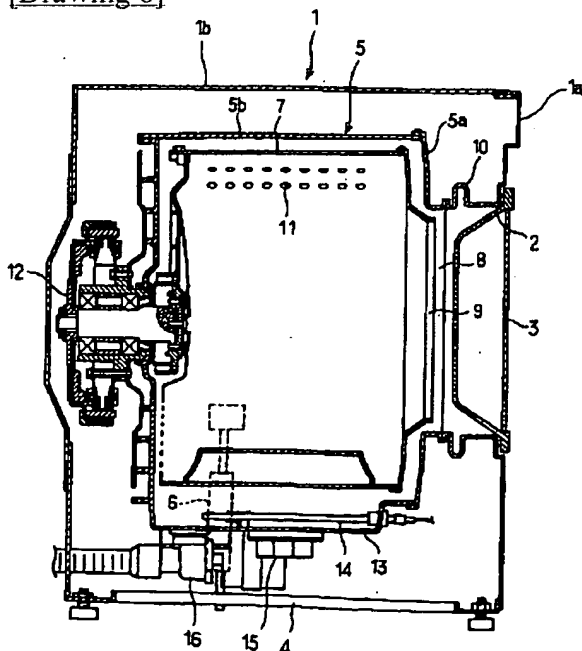
[Drawing 5]



[Drawing 7]



[Drawing 8]



[Translation done.]